

# MANAGING *SIREX NOCTILIO* POPULATIONS IN PATAGONIA (ARGENTINA): SILVICULTURE AND BIOLOGICAL CONTROL

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## ABSTRACT

*Sirex noctilio* is a primitive wood boring solitary wasp with a univoltine life cycle. Characteristic of this species is the occurrence of severely damaging, pulse-like eruptive population outbreaks. During outbreaks, the damage to pine plantations can be severe; tree mortality may reach levels close to 80 percent. Outbreak behavior is thus important when designing management strategies to minimize the impact of woodwasps on the forest resources. Essentially, the aim of any management plan consists of either reducing the intensity of the outbreaks (also minimizing spread) and/or pushing outbreak probability away from the plantation cycle (Corley and Villacide 2005). In Patagonia (Argentina), as in other *Sirex*-affected regions, remarkable outbreaks have been observed. Based on empirical and simulation modeling studies, silvicultural treatment of plantations including usual thinning practices (removing stressed and/or suppressed trees) and sanitary thinning have resulted in a strong reduction in the intensity of damage and/or its occurrence (Villacide and Corley 2006). In turn, biological control by the nematode *Beddingia siricidicola* has reported highly variable parasitism rates, reaching 80 percent in some sites (Villacide and Corley 2008). However, these values do not appear to be directly linked to the effective *Sirex* decrease in tree mortality. A significant *Sirex* impact has been recorded in Patagonian plantations, even in the presence of high levels of parasitism by the nematode (between 60 and 80 percent). Parasitism rates by parasitoids have been reported only for *Ibalia leucospodes*. In field conditions, *Ibalia* may parasitize up to 40 percent of its hosts. Because of this, *I. leucospoides* is generally reported as a successful control agent

of *S. noctilio*; however, some studies suggest that under some environmental conditions its regulatory role is secondary to that of other parasitoids. Because the parasitoids *Rhyssa persuasoria* and *Megarhyssa nortoni* have been introduced only recently, their contribution to *Sirex* control has not yet been reported. Despite this, *M. nortoni* was found in other sites far from the original release points and can prove a significant contribution to woodwasp mortality in Patagonia (Corley and Bruzzone 2009). We note that, among an array of tools used for the management of woodwasp populations, an integrated pest management protocol with strong involvement of silviculture practices is likely to obtain the best results.

## Literature Cited

- Corley, J.C.; Villacide, J.M. 2005. **Una visión dinámica del manejo de la plaga forestal *Sirex noctilio***. IDIA XXI 8: 136-138.
- Corley, J.C.; Bruzzone, O.A. 2009. **Prolonged diapause and the success of parasitoids in biological control**. Biological Control. 51(3): 471-474.
- Villacide, J.M.; Corley, J.C. 2006. **Control de niveles poblacionales endémicos de la avispa de los pinos *Sirex noctilio* (Hymenoptera: siricidae) mediante el raleo sanitario de hospederos atacados**. RIA-Revista de Investigaciones Agropecuarias. 35(1): 121-134.
- Villacide, J.M.; Corley, J.C. 2008. **Parasitism and dispersal potential of *Sirex noctilio*: implications for biological control**. Agricultural and Forest Entomology. 10: 341-345.